DEC 2005 (22) (28)

No. 04-1034 *consolidated with* No. 04-1384

In the
Supreme Court of the United States

JOHN A. RAPANOS *et al.*,
Petitioners,

v.

UNITED STATES,
Respondent.

JUNE CARABELL, *et al.*,
Petitioners,

v.

UNITED STATES ARMY
CORPS OF ENGINEERS
et al.,
Respondents.

On Writs of Certiorari to the United States
court of Appeals for the Sixth Circuit

MOTION OF AMICUS CURIAE JEROME B. CARR, Ph.D. TO FILE A LATE BRIEF IN SUPPORT OF THE PETITIONERS

Brian M. Hurley
Rackemann, Sawyer & Brewster
One Financial Center
Boston MA 02111

MOTION

Pursuant to Supreme Court Rule 37, I have tried to secure written consent for the late filing of the attached *Amicus Curiae* from counsel for the Petitioners and Respondents. Although counsel for the Petitioners granted such consent, counsel for the Respondents withheld it, even though *Amicus* had been told that the Respondents had been granted a time extension for one of their Briefs. Accordingly, I, Jerome B. Carr, Ph.D. telmatologist (wetland scientist) and Certified Professional Hydrologist, author of theBrief *Amicus Curiae* moves this court for permission to late file the Brief *Amicus Curiae* which is submitted herewith. *Amicus* makes this motion on the following grounds.

Amicus curiae, Jerome B. Carr, Ph.D. has 40 years experience in water sciences including hydrology, limnology (study of lakes), meteorology, oceanography, telmatology (study of wetlands), and water quality. For the past 30 years, I have worked mainly in the fields of hydrology and wetland sciences. In 1983, when the Commonwealth of Massachusetts passed more restrictive wetland regulations, the head of the Wetlands Division of the Mass. Dept. of Environmental Protection stated at a meeting presenting the more restrictive regulations, that Mass. was going to protect until we understand how to manage our wetland resources. On the next day I began a program of very thorough research on wetlands, their evolution, and function. I am now the only scientist in Mass. who is a member of the International Peat Society. I found in their Proceedings of the International Peat Congresses, the world class research that I needed for the understanding of wetlands and their function. On those ideas, I conducted my own field research whenever it would serve both my desire for knowledge and my clients' needs. I am a member of nine other professional scientific organizations, and subscribe to over 20 scientific journals. In addition I have built a very large wetland library at the Carr Research Laboratory, Inc. which wasfounded in 1974. When

graduate students select a wetland topic for their M.S. Thesis, and cannot get the references they want from inter-library loan, they have been referred to me and my library for hard to find books and papers. Often, I have almost everything they are looking for, and I supply them with books and papers that they had never found in their review of the technical literature.

The only reason I have for asking for permission to have the court accept this Brief *Amicus Curiae* is because I want to raise and answer **one very fundamental question** that has not been presented to this Court; knowing that this question will make the Court's work far simpler and its decision based on defensible world class hydrology and wetland science. That question is:

> **"How can wetlands physically or jurisdictionally contribute to intra- and/or inter-state or foreign commerce via navigable waters, when most vegetated wetlands have been proven to be net sinks (consumers) of water and thus a detriment to the amount and function of navigable waters?"**

The science based answer to that question is simple, straightforward and direct; and will make the Court's decision far easier by eliminating debate over minutiae.

The only reason I have for asking for acceptance of this late Brief *Amicus Curiae* is because the Clerk's staff at the Supreme Court never returned any of my timely phone calls or voice mails in early November asking for the due date for my Brief *Amicus*. In addition, after making four phone calls in early November requesting this information, I then sent a letter addressed to the Chief Clerk of the court on 23 November requesting the due date. Had I been given the courtesy of a timely phone call, voice mail, or email, I could have met the 2 December 2005 deadline. I only found the deadline date by going on-line and finding the names of the lawyers for the Petitioners. One of them accepted my phone call and that individual was kind enough to tell me thedeadline due date had been one working day prior to my on-line search. Note, that had I been notified on the Monday or Tuesday after Thanksgiving, 28 or 29 November 2005, I could have made the due date of 2 December 2005,

because I would have cancelled all my field work, and expanded my working hours into the late night to finish the Brief *Amicus*.

Note, this work is all *pro bono publico* and neither I nor my firm is being paid for my time and effort. Nobody is prejudiced by this motion or attached Brief.

Wherefore, Jerome B. Carr, Ph.D. respectfully requests that this Court grant *Amicus Curiae* leave to late file the attached Brief in support of linking high quality science to high quality law review by this Court.

Respectfully submitted,

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Dated: 15 December 2005

Petitioners Consent Letters follow this page.

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6 December 2005

Mr. M. Reed Hopper, Esq.
Pacific Legal Foundation
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3900 Lennane DR
Sacramento CA 95834

Dear Mr. Hopper:

As a Certified Professional Hydrologist and a telmatologist (wetland scientist), I am writing to request consent for a late filing of an *amicus* brief from all three parties for Docket Number 04-1034 (John A. Rapanos *et ux et a*), and Docket Number 04-1384 (June Carabell *et al*), and I understand that these two cases have been joined together. My brief will be in support of the petitioners.

The reason why I am making this request for a late *amicus* brief is because I could not get an answer to the question from the Supreme Court Staff on what the due date was for *amicus* briefs. In early and mid-November I phoned the Clerk's Office four times and either spoke to someone or left a voice mail message, and no one ever returned my call. On 23 November 2005, I sent a letter to the Chief Clerk's office at the Supreme Court asking the same question, and I never got a reply. They apparently lacked time to even send me a four or five word e-mail, or a fax, or a 30 second voice mail with a due date. Had I been given the due date of 2 December, it would have been met.

As a professional working with wetlands and hydrology for over 30 years, and as someone who has been doing research on wetland function and evolution for over 20 years, and as the only wetland scientist in Massachusetts who is a member of the International Peat Society, I believe that a few pages of fundamental wetland science will be of great help to the Supreme Court. I recently heard what must be an old saying that "Science and politics don't mix." However, I very firmly believe that science and law should mix since both are based on precision and logic to better serve our citizens in the long run.

Thus I hope that you will be so kind as to write me a Consent Letter granting me permission to submit a late *amicus* brief. I can have it in your hands no later than Tuesday 13 December via express mail, if I am granted consent by all three parties by noon on Friday, given that I will need the weekend to produce a document to meet your filing requirements and format. Thank you for your kind and prompt attention to this matter. Please reply by FAX or e-mail if your consent will be granted.

Most cordially,

Jerome B. Carr

Jerome B. Carr, Ph.D.
Telmatologist (Wetland Scientist) &
Certified Professional Hydrologist

Via Fax and Certified Express Mail

As the representative for the Petitioners, John A. Rapanos et al, I hereby consent to this request for a late *amicus* brief.

M. Reed Hopper, Esq. (Date)

supreme court 31st 05

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6 December 2005

Mr. Timothy A. Stoepker, Esq.
Dickinson Wright PLLC
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500 Woodward AVE
Detroit MI 48226-3425

Dear Mr. Stoepker:

As a Certified Professional Hydrologist and a telmatologist (wetland scientist), I am writing to request consent for a late filing of an *amicus* brief from all three parties for Docket Number 04-1034 (John A. Rapanos *et ux et al*), and Docket Number 04-1384 (June Carabell *et al*), and I understand that these two cases have been joined together. My brief will be in support of the petitioners.

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Most cordially,

Jerome B. Carr

Jerome B. Carr, Ph.D.
Telmatologist (Wetland Scientist) &
Certified Professional Hydrologist

As the representative for the Petitioners, June Carabell et. al. I hereby consent to this request for a late *amicus* brief.

Timothy A. Stoepker, Esq. 12-7-05 (Date)

Via Fax and Certified Express Mail

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In the
Supreme Court of the United States
October Term, 2004

No. 04-1034 *consolidated with* No. 04-1384

JOHN A. RAPANOS *et al.*,
Petitioners,

v.

UNITED STATES,
Respondent.

JUNE CARABELL, *et al.*,
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v.

UNITED STATES ARMY
CORPS OF ENGINEERS
et al.,
Respondents.

On Writs of *Certiorari* to the United States
Court of Appeals for the Sixth Circuit

BRIEF OF *AMICUS CURIAE* JEROME B. CARR, Ph.D. TELMATOLOGIST (WETLAND SCIENTIST) & CERTIFIED PROFESSIONAL HYDROLOGIST IN SUPPORT OF THE PETITIONERS ON THE MERITS

QUESTIONS PRESENTED FOR REVIEW

1- "How can wetlands physically or jurisdictionally contribute to intra- and/or inter-state or foreign commerce via navigable waters, when most vegetated wetlands have been proven to be net sinks (consumers) of water and thus a detriment to the amount and function of navigable waters?"

2- Since someone may suggest that water quality or some other behavior of wetlands may impact navigation; very briefly, how do wetlands affect water quality and other presumed wetland values?"

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INTERESTS OF THE *AMICUS CURIAE*

Amicus Jerome B. Carr, Ph.D. seeks to bring to the Court's attention his views and the views logically derived from scientific interpretation of data published in the scientific literature concerning the authority of the Army Corps of Engineers to regulate filling of inland vegetated wetlands under 33 U.S.C. § 1251 *et seq.* ("CWA"). [1]

Amicus curiae Jerome B. Carr, Ph.D. has spent about 85% of his 40 year career to date working on sciences associated with water, including but not limited to description of and/or quantification of waters behavior, its cycling between the atmosphere, its quality, and the life therein. I was a Certified Wetland Scientist in the State of New Hampshire, which was thefirst state of the union which certified individuals in the science, and have been a Certified Professional Hydrologist by the American Institute of Hydrology since 1984. Knowing that both science and the interpretation of the law requires detailed knowledge and precise application of that knowledge to benefit all our citizens and residents, I am seeking to assist the Court by review of the water budgets of open water bodies such as navigable lakes, and the real world impacts of the vegetative wetlands which border our lakes, salt water bodies, and all their tributaries.

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1 Pursuant to Supreme Court Rule 37.6 *Amicus* states that he alone authored this Brief, without benefit of counsel, and that no one other than the *Amicus* made a monetary contribution to the preparation or submission of the brief. Pursuant to Supreme Court Rule 37.3(a) *Amicus* submitted a consent letter to both parties to the filing of this Brief, and counsel for both Petitioners returned signed consent. The Respondents' counsel did not consent.

JURISDICTION

The definition of "waters of the United States" is found in 33 Code of Federal Regulations (CFR) Part 328.3. Wetlands are included as sub-part (7). That inclusion of wetlands as waters of the United States relative to navigable waters should logically apply only to wetlands that are sources of water, and not to net consumers (sinks) of water.

SUMMARY OF THE ARGUMENT

It is well known at the highest levels of hydrologic and wetland sciences, that with very few exceptions, vegetated wetlands are net consumers of water and as such are detrimental to navigable waters. This was initially demonstrated during research on cattail marshes which typically abut open waters or deep marshes (water 6 feet deep or less) in 1911 as reported in "*A Treatise on Limnology.*" [2] This has been confirmed by numerous other more recent studies conducted *in situ*.

The published values of average annual evapotranspiration water loses to the atmosphere for the most common vegetated wetlands range from about 1.7 times average annual local lake evaporation to in excess of 3.0 times lake evaporation. When the calculations are done, the water loses from vegetated wetlands exceed, and often far exceed, average annual precipitation. Thus vegetated wetlands are net sinks for waters which degrade the function navigable waterways, and do not help preserve them or their commerce related functions. It turns out that excavation of vegetated wetlands creates more potential navigable water surfaces and thus adds to downstream flows. Also, filling of vegetated wetlands to the extent that

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2 Hutchinson, G. Evelyn; *A Treatise on Limnology*, Volume III, page 196,. John Wily & Sons, New York, 1975.

they become functional uplands also adds to downstream flows. Thus either alteration results in benefits to navigable waters and thus wetlands (a) should not be regulated as waters of the United States, or (b) should not be inhibited by the regulators in a fashion that excludes proposed land use changes, other than by ensuring no downgradient harm to functional open waters by erosion or added flooding.

ARGUMENT

Scientific evaluation of wetland hydrology is typically done by making *in-situ* measurements of (a) interception of rainfall which results in direct evaporation from plant surfaces, (b) direct evaporation from soil surfaces under the plant community, and (c) transpiration (passage of gas or liquid as a vapor through the skin, a membrane or other tissue). The sum of these are called evapotranspiration. In the case of plants, leaves have small pores that allow passageof gas and this is the route to the atmosphere for water taken in by plant roots.

The best way to understand why wetland vegetation pumps more water to the atmosphere than does upland vegetation is to understand how plant roots and soil hydrology interact. In uplands, after a rainstorm, a zone of moisture passes vertically through the soil as groundwater recharge. For the duration of time that this water is in contact with root surfaces, water is taken up by plants and much of that water is released through the leaf pores. In New England, rainfall events are spaced on average about every six days. Thus as the soil drains between rainfall events, there is less and less water available for upland plant uptake. In a wetland environment, groundwater that is recharged in upgradient uplands is discharged into the wetlands. Most wetlands have saturated soils within 12 inches of the surface for allof the year. Thus water is available for uptake by plant roots all year, and there is no constraint to water access for plant transpiration in wetlands, with a possible except during significant droughts.

For forested wetlands, evapotranspiration was measured at 1.8 times open water evaporation in a New Hampshire wetland.[3] An evapotranspiration/ lake evaporation ratiosummary for typical wetland herbs was published by Boyd[4] but note that his own measured ratios require a correction from pan evaporation to lake evaporation, so his own water loss ratios require a significant revision upwards. Without returning to the original references he quotes in the lower part of Boyd's table 2, similar upwards adjustments may be required to ratios if pan evaporation was used rather than lake evaporation. The cattail environments referenced in Boyd's table 2, had evapotranspiration rates that ranged from 1.75 to 2.5 times local lake evaporation, with an average ratio of 2.0. Thus while rates are variable depending on physical settings, emergent wetlands from cattails to wooded swamps are consistently reported as losing more water to the atmosphere than open water lake evaporation. Note also in this study, the statements that only plants that cover water surfaces such as duckweed and water lilies consistently reduce the water lost compared to open water surfaces.

To relate these ratios to the state of Michigan where the court sites are based, I used the precipitation and lake evaporation from the Central Michigan area around Lansing, Michigan.[5] The results are presented on the next page.

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3 Hall, F.R. *et al.*, *The Influence of a New England Wetland on Water Quantity and Quality*; Research Report #4, Water Resource Research Center, University of NH, Durham NH. 1972.

4 Boyd, C.E.; *Evapotranspiration/ Evaporation Ratios for Aquatic Plants*; Journal of Aquatic Plant Management, Vol. 25, pp. 1-3. January 1987.

5 *Climatic Atlas of the United States*, U.S. Dept. of Commerce, National Climatic Center, Ashville, NC, reprinted 1979.

- Average annual precipitation = **31.5** inches per year
- Average annual lake evaporation = **30.25** inches per year
- Cattail marshes range from = 30.25 x 1.75 = **52.94** in/yr to 30.25 x 3.0 = **90.75** in/yr. inches per year.
- Wooded swamp water loss = 30.25 x 1.8 = **54.45** in/yr.

Thus all of these wetland types are net sinks for water and cannot contribute to the value of navigable waters because they lose more water to the atmosphere than they receive as precipitation. Given their negative impact on navigable waters, they should not be jurisdictional or categorized as regulated "Waters of the United States" for any transportation or commerce activities.

In terms of altering emergent vegetated wetlands which abut open water bodies that serve as navigable waters in some context, it is to be stressed that both filling or excavation can enhance water release to downgradient surface waters. Excavation into a permanent pond begins to add water to the downgradient navigable waters, while filling wetlands to create upland status actually increases the available water for all downgradient surface waters even more than excavation does. Note that mean annual runoff for central Michigan is about 10 inches per year, and thus conversion of an wooded wetland to an upland would add about to 33 inches of new available water for all downgradient navigable waters due to 10 inches of new upland runoff plus another 23 inches of elimination of excess evapotranspiration.

As mentioned earlier, plants that cover the surface of standing water reduce lake evaporation. However, those areas are classed as shallow marsh wetlands in standing water, and do not function as emergent wetlands which are growing on unflooded saturated soils for most of the year. Note that some ponded water wetlands, dominated by mostly submerged aquatic weeds are also valuable as navigable waters and water supply for downstream areas depending on dominant plant types. Other open water

areas dominated by different aquatic plant types can be uses as navigable waters in spite of functioning as net sinks for water.[4] The only other wetland type that does not offer water losses at rates less than open water evaporation are sphagnum moss type bogs with peat deposits. In these bogs, water losses are at a ratio of about 0.9 times local lake evaporation.

SECONDARY WETLAND FUNCTIONS

As a final matter, there may be some people who might wish to suggest to the Court the idea that other values of emergent vegetated wetlands somehow should apply to the commerce clause or navigable waters. These likely concepts are very briefly reviewed below.

Water Quality. Based on my 30 years of sampling water quality in New England, I have yet to find a wetland that improved water quality. I measured the pH (acidity) of water coming out of one wetland, and the water was so acid it could kill fish. Once peat formation starts in forested wetlands, the water coming out of the wetland is so brown it is called New England tea. Note that this brown water contains tannic acid which is a proven carcinogen. In terms of actual function, clean naturally filtered groundwater is what enters the wetlands from the upgradient side, with colors typically of around 10 color units. However, even small wetlands releasing this water after it passes through the wetland soil can produce colors in excess of 100 color units. One moderate size wetland I tested had a water color that was beyond the instrument's scale of 500 color units.

As for heavy metal uptake by the plants in vegetated wetlands, it can be of nominal value in case of a large release. However, thereafter the plants keep recycling the heavy metals, and to the extent that the plants are eaten by wildlife, the metals are returned to the ecosystem. Due to this constant uptake by live plants and release at the soil surface by dying plants, this explains why heavy metal

concentrations are maintained near the surface of wetland soils and not buried at depth as some people postulate.

Wetlands Protecting Water Bodies from Upland Sedimentation. Most people know that open water bodies fill by accumulation of leaves from trees, and deposits from water lilies, aquatic plants, and cattails. As an example, when my grandfather was a teenager, he planted water lilies for his mother in Carr's Cove on Cayuga Lake in New York. He dove into the water that was almost six feet deep to plant the water lilys. About 50 years later when I was about 12 years old, I found that it was very difficult to row across the water lily portion of Carr's Cove because of the muck generated by the water lilies was touching the bottom of the small rowboat. In addition, cattails and the giant reed *Phragmites* soon invaded the edge of the lake on the water-lily muck, and the major portions of the cove edges lost any ability to be used a navigable water. Thus direct deposition of mineral soils is frequently less than organic muck formation in most water bodies surrounded by wetlands.

Flood Control. Vegetated wetlands soon start accumulating organic matter known as peat. The average rate of peat accumulation formed outside of standing water is 4 inches per 100 years. Thus, even in a drainage basin with zero land use changes to increase flooding, the peat accumulation process raises floodplains in areas dominated by vegetated wetland by about 4 inches per 100 years.

Note also, that once peat formation starts, the organic soils soon develop extremely low permeabilities. Thus once the soils are impacted by rain, they tend to stay full of water, and the void spaces in the soils are not available forstorage of flood waters. Figure 1 on page 8 shows water flow monitoring conducted in two adjacent wetlands.[6]

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6 Heikurinen, L.; Comparison Between Runoff Conditions on a Virgin Peatland and a Forest Drainage Area" Proceedings of the 5th International Peat Congress, Vol. 1, pp 76-86, Wydawnictwa Czasopism Technicznych Not, Warsaw, Poland 1976.

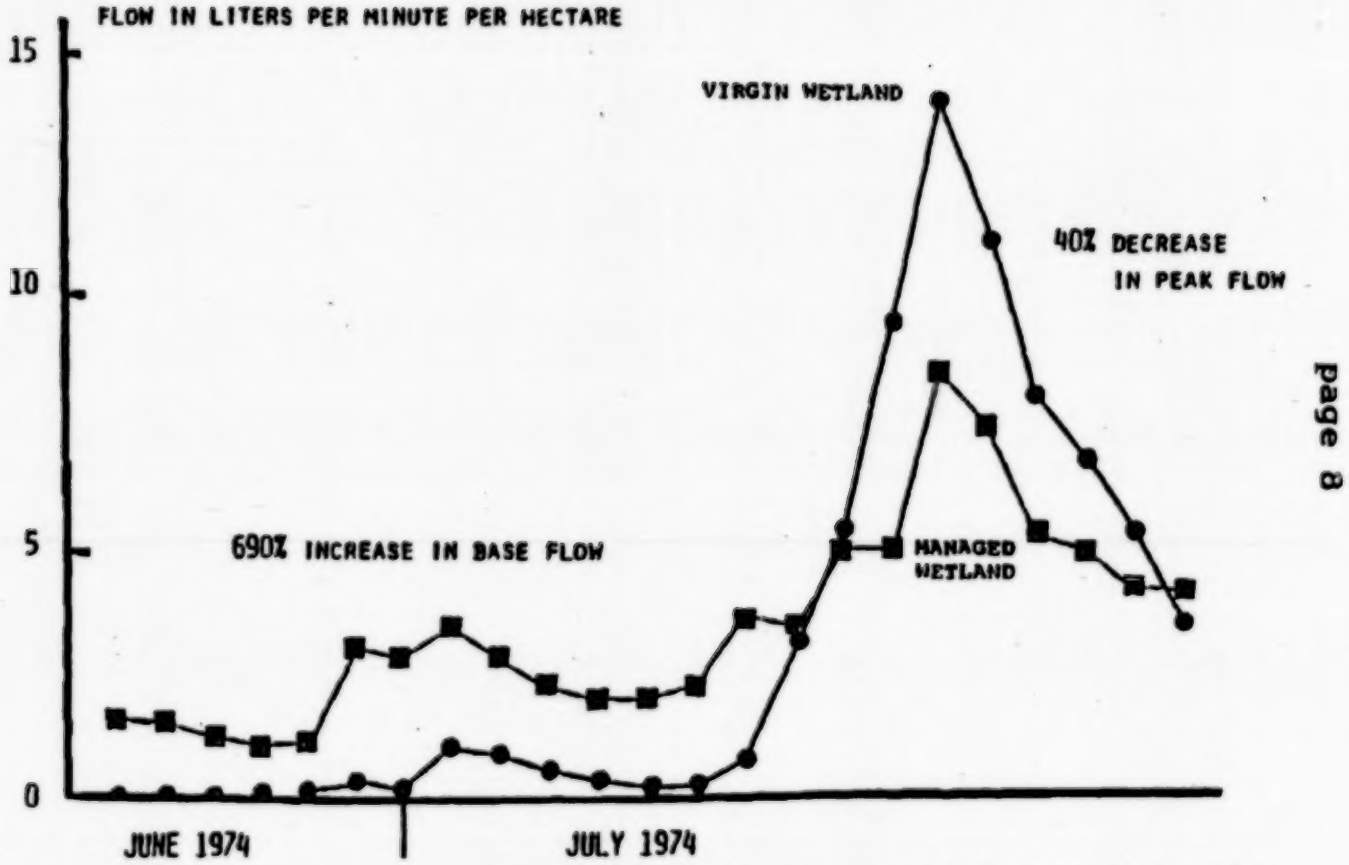


Figure 1. Comparison of Adjacent Managed Wetland with an Adjacent Virgin Wetland.

Figure 1 shows that the virgin wetland (with flows represented by circles) which had not been altered by man in its recent history, released no water during dry periods, and released a large peak flow which created significant downstream flooding following a large rain storm. In contrast, the adjacent wetland, managed by wide-spaced ditching that kept the wetland intact as a wetland forest (with flows represented by squares), allowed drainage between rain fall events. The managed wetland had continuous outflow even during dry periods, and the flood peak from the same storm was 40% lower than the peak flood flows from the virgin wetland. This proves that mature unmanaged wetlands are not valuable for (1) for water supply for downstream navigable waters, or (2) flood control.

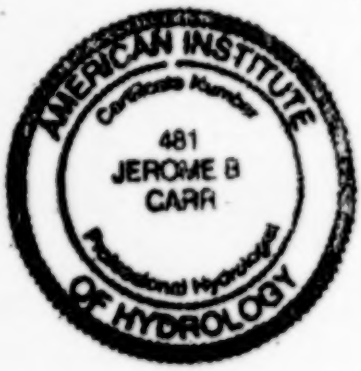
The message for all parties is that the Unites States does not benefit from protection of emergent vegetated wetlands, but can significantly benefit from science based wetland stewardship.

CONCLUSION

Open waters are in and of themselves useful as navigable waters for commerce. Shallow water wetlands such as areas dominated by water lilies or duckweed are also useful as water supplies for downgradient open waters. Some areas dominated by other partially submerged aquatic plants are functional navigable waters, but those areas may have a negative downstream impact by becoming a sink for water to downstream areas. These ponded water bodies remain useful as navigable waters except if isolated from all other surface waters.

In terms of emergent vegetated wetlands, starting with cattail marshes which evolve into shrub and forest swamps; the entire series of natural transitions are of no value to abutting surface water bodies because they lose more water than what arrives as precipitation. As such,

they are net sinks for water and clearly have a negative impact on abutting or distant downgradient surface waters in terms of navigation. Thus those emergent wetlands should not be classed as waters of the Untied States and they should not require a permit under any existing federal legislation, including the Clean Waters Act.



Respectfully submitted,

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Certified Professional Hydrologist
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Dated: 15 December 2005